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the headings of a work on sign language, which itself formed part of the Annual Report of the Bureau of Ethnology now in press.¹ Its publication will direct attention to the interpretation of ideographic characters in many parts of the world, through the significance of gesture signs, and also react upon the scientific study of sign language as a former general mode of communication between men. Though the published presentation of the suggestion had hitherto been imperfect, he had already received gratifying assurances from European scholars of their success in discovering gesture signs included in Egyptian and Akkad glyphs, as well as in the radicals of those languages. Mr. Hyde Clarke, Vice-President of the Anthropological Institute of Great Britain and Ireland, had specially shown interest in the investigation.

President Powell was glad to note that rational principles and methods were being applied to the solution of such questions. The true value of facts consists in their proper and rational interpretation. Human history is being rewritten to satisfy this sentiment. The isolated facts of the old style of chronological history are useless, and now it is necessary to go over the ground again, for the purpose of deducing from them the laws of progress and of society. It is the same with ethnological facts. These pictures convey no meaning in themselves, and the work of true science is to discover such laws as will lead to their proper interpretation.

FORTY-FIRST REGULAR MEETING, June 7, 1881.

Professor Samuel Porter read a paper entitled VOWEL SYSTEMIZATION, of which the following is an abstract:

On the theory of Helmholtz, the character of each vowel is produced by the reënforcement of harmonic tones in the oral cavity. That of Donders finds it in the noises that go with the tone. The truth lies in a combination of the two.

¹“Sign Language among North American Indians compared with that among Other Peoples and Deaf-Mutes.” By Garrick Mallery. In “Annual Report of the Bureau of Ethnology,” 1879-80, pp. 269-508.

In classifying the vowels we are to look to the positions and motions of the organs. The scheme of Mr. A. M. Bell assigns to each vowel a distinct palato-lingual position, to which may be superadded a labial or a nasal modification. It divides the vowels, "horizontally," into "back," "front," and "mixed," as the place of closest constriction falls on the soft or on the hard palate or in some sort between the two. These it subdivides, "vertically" (so described with questionable propriety, the subdivision being as truly horizontal as the main division), into "high," "mid," and "low." High-back: *pool*. Mid-back: *mōst*. Low-back: *saw*. High-front: *see*. Mid-front: *été* (Fr.). Low-front: *their*. High-mixed: *earth*. Mid-mixed: *gabe* (Ger.) Low-mixed: *bird*. These are the "primary" of Mr. Bell and the "narrow" of Mr. Henry Sweet; and for each there is a corresponding "wide:"—*e. g.* narrow: *peel, été, their*; wide: *pīll, pet, that*. Labials are called "round;" thus, *pool* is high-back-narrow-round. Mr. Bell explains the wide by an expansion of the pharynx; Mr. Sweet, by a depression of the upper surface of the tongue. In this Prof. Porter agrees substantially with Mr. Sweet; but, instead of two, he would, for nearly all the vowels, mark four degrees, which he would call *close, half-open, open, and open-depressed*. Thus, the *i* half-open, as Frenchmen, Germans, and Scotchmen pronounce *bīt, īs, sīck, position, &c.* The open depressed, a drawling, dialectic pronunciation of the short stopped vowels, *i, e, a*, and others; or, sometimes, properly used for emphasis; a natural concomitant of nasalization; also, the initial of some diphthongs, a depressed degree of the open *u*, in *but*, being the initial of our long *i*.

Prof. Porter would make only a two-fold instead of the three-fold subdivision of the "mixed," and would place in this class the French *eu* in most cases, and the German *ö* in at least many cases, and not among the "front" as a labialized *e*, as do Messrs. Bell and Sweet; and would place here the *u* in *up, but*, instead of among the "back" vowels.

Concerning the Italian *a*, the *a* in *father, ask, pass*, etc., Prof.

Porter maintains that the place of constriction is not on tongue and palate, but between the back wall of the pharynx and the tongue at or just above the epiglottis. It belongs, therefore, not among the "back" vowels, but in a class by itself; and with this agrees the fact that the more open form of this vowel is the naturally long, while for all others the open, or "wide," is the naturally short. It is important to notice that the guttural passage, the *fauces*, may be so adjusted as to make a compartment distinct from the fore part of the mouth, and separated on the anterior edge of the *ramus* of the lower jaw. With the tongue for a floor, pharyngeal muscles for side walls, the elastic curtain of the soft palate for a roof, the muscular "pillars of the fauces" flanking the entrance, we have a chamber highly dilatable and contractible and adjustable in various ways. Prof. Porter holds that, for the Italian *a*, the resonance chamber is limited to the compartment made by this passage and the lower part of the pharynx. For the proper "back" vowels, *oo*, *o*, and *au*, the soft palate is curved forward toward the tongue, contracting the entrance and at the same time the walls of the passage, and extending the resonance chamber forward.

The number of possible vowel-modifications being theoretically infinite, a perfect system will mark just so many distinctions as will seem to be necessary and sufficient, considered as approximative points of reference.

Mr. Ward called attention to the similarity of the conclusions reached by Prof. Porter to those which he had announced in a paper read before the Society on the 21st of December last, and read a paragraph from the abstract of that paper as printed in the "Abstract of Transactions," (p. 106). He also testified to the general rationality and correctness of the order in which Prof. Porter had arranged the principal vowels with respect to the probable location of the sound in the mouth and pharynx. He commented upon Bell's chart representing his system of vowel sounds, and pointed out a number of inconsistencies in it.

President Powell said that in consequence of the infinite variety of possible sounds, it was impossible to classify them except by types. No two persons speak alike ; no two voices are alike ; and instrumental tests have shown that the same person cannot pronounce the same vowel twice in precisely the same way. Prof. Bell had frequently demonstrated this by means of the telephone. The effect on the instrument was different with each attempt, and having made a sound once he found that he could never exactly repeat it. The passage of a vibration of air through the complex mechanism of the human voice is so heterogeneous in its character that it is impossible for two men to utter precisely the same sound. Two sounds thus made may be very nearly but cannot be exactly the same.

In the course of his work during several years past, in endeavoring to devise an alphabet with which to write the sounds embraced in various Indian languages, he had come to the conclusion that he could not describe sounds by describing the way in which they are made ; that, in the present state of the science of phonology, it was only possible to compare them with those by which they would be recognized. He could only describe the way in which something like the sound is made. He therefore thought that a common system of pronunciation for all languages was a physical impossibility.

FORTY-SECOND REGULAR MEETING, June 21, 1881.

Prof. G. Brown Goode read a paper entitled THE FISHERMEN OF THE UNITED STATES. The following is an abstract :

For every man engaged in the fisheries there is at least one other man who is dependent to a considerable extent upon his labors for support. To the class of "shoresmen" belong (1) the capitalists who furnish supplies and apparatus for the use of the active fishermen ; (2) the shopkeepers from whom they purchase provisions and clothing ; and (3) the skilled laborers who manufacture